

**UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF INDIANA
HAMMOND DIVISION**

NIBCO INC.,)	
)	
Plaintiff,)	
)	
v.)	NO. 3:02-CV-124 PPS
)	
TYCO INTERNATIONAL (U.S.), INC.,)	
TYCO VALVES & CONTROLS, INC.,)	
TYCO VALVES & CONTROLS, L.P.,)	
and TV&C GP HOLDING, INC.,)	
)	
Defendants.)	

OPINION AND ORDER

On July 12, 2004, the Court issued a claim construction opinion setting forth its interpretation of the disputed terms in U.S. Patent No. 4,740,347 (the “‘347 patent”). Tyco now moves for summary judgment of noninfringement. Because we find that Tyco does not infringe every step of any of the Claims, that motion is granted.

I. BACKGROUND

The ‘347 patent describes a method for manufacturing a butterfly valve. The assignee of the patent, NIBCO, is the Plaintiff in this case. Generally, butterfly valves have a body with a ring-shaped central passageway through which fluids pass. A valve seat is formed in the central passageway. A valve stem is placed in the openings and/or blind sockets in the valve body and is generally transverse to the passageway. The valve stem is connected to a valve disc and rotates the disc to open and close the passageway. The valve disc, when in the closed position, forms a seal with the valve seat and prevents fluid from flowing through the valve passageway. In order to facilitate the opening and closing of the disc, the stem frequently is placed on

bushings (also called bearings) in the stem openings and/or blind sockets to center and support the stem, as well as to reduce the friction between the valve stem and the openings and/or blind sockets in the valve body.

In order to utilize bushings to reduce friction between the valve stem and the openings and/or blind sockets, the bushings and other components need to be properly aligned during manufacturing. Prior to the '347 patent, when bushings were molded directly into valve bodies, the bushings were absolutely aligned with respect to the valve body. This result was achieved by carefully machining portions of the valve body. The machined valve body was then fixed in position in a mold and the bushings were held in absolute alignment with respect to the valve body, often by an aligning structure that was external to the mold cavity. The elastomeric material that forms the valve seat would then fill the voids between the bushing and the valve body. This process, especially the machining of the parts, can be expensive.

The '347 patent aligns the bushings relative to each other rather than relative to the valve body. More specifically, the '347 patent achieves its method of relative alignment by using a valve stem replica and valve disc replica. The valve stem replica is inserted into the valve stem opening, through the first bushing, through the valve disc replica and into the second bushing located in a blind socket. This assembly of components is completely enclosed inside an injection mold. Elastomeric material is then injected into the assembly to make the position of the bushings permanent. As mentioned, this process avoids the expense of machining the parts if the bushings are aligned relative to the valve body, as the bushings are already accurately aligned relative to one another, and can thus allow the valve stem to spin freely when it is later inserted into the assembly.

Tyco manufactures butterfly valves under the name Keystone 221/222. The first step in its process is obtaining cast valve bodies from a supplier. Several parts of the valve body are machined in order to make the cast valve bodies useful to Tyco. A more precise circular flow opening, the opening through which liquid will eventually flow, is machined into the valve body. This also provides a more suitable surface for later bonding with the rubber seat that will encase the flow opening. Tyco also machines the faces of the valve body so that they are flat and parallel to each other and to the centerline of the valve body. The top surface is machined flat and made perpendicular to the faces. They then drill upper and lower valve stem bores, the holes through which the valve stem will pass in the finished product, through each of the valve bodies. After the machining, the valve bodies are essentially ready to be molded.

The mold Tyco uses consists of several parts. There is an upper and a lower mold plate. The lower mold plate has two stop blocks. The top stop block is located where the top surface of the valve body will be located during molding. The lower stop block is located where the base of the valve body will be located during molding. Each stop block has a rectangular portion and a cylindrical portion, with an alignment bore passing through both portions. The cylindrical portion of the stop block has screw threads through which the alignment rods will be screwed to position the alignment rods during molding. Bolted to the lower mold plate is a lower mold core, a circular projection with a metal donut on top. The donut has two bores, one on each side, and each is lined up with the alignment bores opposite them.

The valve body is placed over the lower mold core so that the donut is inside the flow opening of the valve body and the flat top surface is flush against the upper stop block. Tyco then screws two t-shaped alignment rods into the alignment bores on each end of the mold. The

alignment rods have the bushings on them, and the tip of each alignment rod rests inside the corresponding donut bore. A measured quantity of rubber material is placed between a hydraulic ram and the upper mold plate of the molding machine. The upper mold plate is lowered so that a circular projection, or mold core, on it nests within the center of the donut. Hence, the valve body is clamped between the upper and lower mold plates, although portions of the valve body remain visible during the entire molding process. The rubber material is heated to melting, the hydraulic ram is lowered, and the melted rubber moves into the cavity formed between the mold cores and the inner diameter of the central passageway to form the rubber valve seat, and the gap between the inner diameter of the valve stem bores and the outer diameter of the valve stem bushings. At some point after the rubber is put in the mold, the alignment rods are withdrawn. The upper mold plate is lifted, the valve body is removed from the machine, and excess rubber is trimmed. The valve body is then painted, and a butterfly valve disc is inserted into the flow passageway. In some models, a spacer is then inserted into the upper and lower valve stem bores to hold the bushings in place during use. A valve stem is threaded through the upper valve stem bore, through the upper bushing, through the valve disc, through the lower valve stem bore, and into the lower bushing at the base of the valve body. The valve disc is then screwed to the valve stem. A threaded plug is screwed into the bore at the base of the valve body to close the lower valve stem bore.

II. DISCUSSION

“Summary judgment is appropriate when there is no genuine issue as to any material fact and the moving party is entitled to judgment as a matter of law.” *Howard v. Lear Corp. EEDS & Interiors*, 234 F.3d 1002, 1004 (7th Cir. 2000). A genuine issue of material fact exists only if

“the evidence is such that a reasonable jury could return a verdict for the nonmoving party.”

Pugh v. City of Attica, Ind., 259 F.3d 619, 625 (7th Cir. 2001) (quoting *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986)). When examining the evidence, the court should draw all reasonable inferences in favor of the non-moving party. See *Haefling v. United Parcel Serv., Inc.*, 169 F.3d 494, 497 (7th Cir. 1999); *Dey v. Colt Constr. & Dev. Co.*, 28 F.3d 1446, 1453 (7th Cir. 1994).

Summary judgment of non-infringement requires a two-step approach. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1304 (Fed. Cir. 1999). First, “the claims of the patent must be construed to determine their scope[,]” and second, an analysis must be performed as to whether the accused device infringes the claims. *Id.* The Court already issued its claims construction opinion in this case, so we are now at the second step.¹

“[T]he claims as construed by the court [must be] compared limitation by limitation to the features of the allegedly infringing device.” *Searfoss v. Pioneer Consol. Corp.*, 374 F.3d 1142, 1148 (Fed. Cir. 2004). In order to have infringement of a method patent, all claimed steps of the method must be performed by the accused method, either literally or under the doctrine of equivalents. See *Allen Eng’g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1345 (Fed. Cir. 2002).

“Literal infringement of a claim exists when each of the claim limitations ‘reads on,’ or in other words is found in, the accused” method. *Id.* If any single limitation is missing from the accused method, there can be no literal infringement. See *Mas-Hamilton Group v. LaGard, Inc.*,

¹ NIBCO filed a Motion to Reconsider our claim construction opinion in light of *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005), which was decided after our claim construction opinion was issued. In particular, NIBCO argued that *Phillips* should change our construction of two claim terms – “valve disc replica” and “valve stem replica.” NIBCO’s Motion to Reconsider was denied on September 26, 2005.

156 F.3d 1206, 1211 (Fed. Cir. 1998).

If an accused method does not literally infringe a claim, infringement may still occur under the doctrine of equivalents. *See Bayer AG v. Elan Pharm. Research Corp.*, 212 F.3d 1241, 1250 (Fed. Cir. 2000). However, “[t]he doctrine of equivalents is not a talisman that entitles a patentee to a jury trial on the basis of suspicion; it is a limited remedy available in special circumstances, the evidence for which is the responsibility of the proponent.” *Schoell v. Regal Marine Indus., Inc.*, 247 F.3d 1202, 1210 (Fed. Cir. 2001).

An element in an accused method may be the equivalent to a claim limitation if the differences between the two are “insubstantial” to one of ordinary skill in the art. *See Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 36 (1997); *Zelinski v. Brunswick Corp.*, 185 F.3d 1311, 1316 (Fed Cir. 1999). One test for determining “insubstantiality” is whether an accused method does “substantially the same function in substantially the same way to obtain substantially the same result as the claim limitation.” *Id.* at 1316-17. Infringement under the doctrine of equivalents “does not require complete identity for every purpose and in every respect[,]” but does require substantial identity of function, means, and result. *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 609 (1950). The less demanding standard under the doctrine exists in order to hinder the “unscrupulous copyist” who could otherwise imitate a patented invention as long as he was careful not to copy every inconsequential detail of the claimed invention, or to make some “unimportant and insubstantial” change to the claimed invention. *Id.* at 607. To allow such free use of a patented invention would be, the Supreme Court said, “to convert the protection of the patent grant into a hollow and useless thing.” *Id.*

Application of the doctrine of equivalents is limited by the doctrine of prosecution

history estoppel. *See DeMarini Sports, Inc. v. Worth, Inc.*, 239 F.3d 1314, 1332 (Fed. Cir. 2001). Prosecution history estoppel can narrow the scope of the doctrine of equivalents by preventing the patentee from recapturing subject matter surrendered during the prosecution of the patent either by amendment or argument. *Id.* “Unmistakable assertions made by the applicant to the Patent and Trademark Office (PTO) in support of patentability, whether or not required to secure allowance of the claim, [] may operate to preclude the patentee from asserting equivalency” *Texas Instruments Inc. v. United States Int’l Trade Comm’n*, 988 F.2d 1165, 1174 (Fed.Cir. 1993). “In determining whether there has been a clear and unmistakable surrender of subject matter, the prosecution history must be examined as a whole.” *Bayer AG*, 212 F.3d at 1252. An objective standard is applied when looking at the prosecution history, the proper inquiry being “whether a competitor would reasonably believe that the applicant had surrendered the relevant subject matter.” *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1457 (Fed. Cir. 1998).

A. Claims 1, 4, 6, and 11

1. Valve Stem Replica

In the patent at issue in this case, the fourth step of Claims 1, 4 and 11 involves “inserting a valve stem replica through the stem openings in the valve disc replica and both bushings and into the socket.” Claim 6 requires “inserting a valve stem replica through both bushings and the valve disc replica.” In our claim construction order, we held that a “valve stem replica” means “a close copy” of a valve stem. As we will discuss below, because Tyco’s method does not use “a close copy” of the finished valve stem, it does not infringe Claims 1, 4, 6 and 11.

a. Literal Infringement

The valve stem used by NIBCO is a close copy of the valve stem replica, both being a single piece. In contrast, Tyco uses two alignment rods in its allegedly infringing process. There are several material differences between the alignment rods and the valve stem that warrant a finding of no literal infringement. First, the two alignment rods are nearly five times as long as the valve stem, and second, the alignment rods are a substantially different shape than the valve stem. Tyco's alignment rods have at least four different diameters along their lengths, while the valve stem is largely of a consistent diameter. Further, each alignment rod has at least one, and in most cases two, deep O-ring grooves carved around its circumference, while the valve stem does not. These differences make clear that the alignment rods are not close copies of the valve stem, and thus do not literally infringe the '347 patent.

It is true that in our claim construction order we stated that “a close copy of the valve stem’ allows the possibility of a multiple piece valve stem. It would not be unreasonable for the jury to find that a two piece replica is a ‘close copy’ of the original.” Claim Construction Order at 10. Thus, we allowed for the possibility that a two piece stem replica could be considered by a reasonable jury as a close copy of a valve stem. However, the evidence before us on summary judgment as to Tyco's process convinces us that its use of alignment rods that are five times longer than the finished valve stem (along with the other differences between the two that are noted above), establishes that Tyco's alignment rods are not close copies of the valve stem and no reasonable jury could find otherwise.

b. Doctrine of Equivalents

Tyco's alignment rods could still be the equivalent of a valve stem replica if they perform

substantially the same function in substantially the same way to achieve substantially the same result as a valve stem replica. *See Zelinski*, 185 F.3d at 1316-17. This issue turns largely on the extent to which Tyco's valve assembly technique uses absolute alignment of the bushings instead of relative alignment, as the '347 patent applicant disclaimed absolute alignment in the patent's prosecution history.

The '347 patent applicant disclaimed absolute alignment at least two times during the patent prosecution. First, the initial patent application was rejected by the United States Patent and Trademark Office (the "USPTO") on the basis of Patent No. 3,940,108 (the "Edwards patent"). The USPTO explained that "Edwards teaches a process for molding a butterfly valve wherein the reinforcing member is held in place by removable cores which also serve to form openings for the shaft. Although Edwards does not teach molding bushings in place it would be obvious to one skilled in the art that the same process could be used to mold any desired part in place." (Fee Decl. in Support of Motion for SJ, Ex. I-6, pp. 2-3). In response, the applicants distinguished Edwards by arguing that "the present invention teaches that only relative alignment is critical. Prior valve assembly techniques required absolute alignment with respect to a fixed location in the valve body." (Fee Decl. in Support of Motion for SJ, Ex. I-9, pp. 6-7). The second time the patent applicant disclaimed absolute alignment occurred later, during an interview with the USPTO Examiner. There, the applicants "agreed that the main aspect of the invention is the injection of plastic material between bushings (30, 31) and housing (11) to give relative alignment to the valve stem and valve disc." (Fee Decl. in Support of Motion for SJ, Ex. I-13, p. 1). These statements are an unmistakable surrender of claims involving absolute alignment, so prosecution history estoppel prevents NIBCO from recapturing methods of

alignment other than relative alignment through the doctrine of equivalents. *See Texas Instruments*, 988 F.2d at 1174.

We now must determine whether or not Tyco's process uses relative or absolute alignment. The process described in the '347 patent utilizes a single piece valve stem replica to align the bushings. Doing so results in the bushings being nearly perfectly aligned relative to each other, since they are both connected to a single structure. The bushings are aligned relative to one another in that the position of one bushing is dependent upon the position of the second bushing. In contrast, Tyco's two alignment rods independently position each of the bushings. Because the bushings are on two separate alignment rods, the position of one bushing does not affect the position of the other. Tyco's method relies on several pieces acting in concert to determine the position of the bushings. In addition to the alignment rods, all of the following variables play some part in determining the position of the bushings: the alignment of the mold core bores, the position of the lower mold core donut bores, the alignment of the stop block at the top of the valve body with the corresponding mold core bore, the alignment of the stop block at the bottom of the valve body with the corresponding mold core bore, and the machining of the top surface of the valve body. It is thus clear that the Tyco method does not use relative alignment to align the bushings.

In support of its contention that Tyco does not use absolute alignment, NIBCO makes much of the fact that Tyco's process results in the centerlines of their valve stem openings being offset both with respect to one another and the common centerline of Tyco's bushings. As the Court sees it, this is much ado about nothing. Presumably, NIBCO raises this point in an attempt to show that because the centerlines are off, absolutely aligning the bushings relative to the valve

body would be unlikely, since the centerlines are not substantially the same from mold to mold. While this might affect the tolerances to which the valves are built, NIBCO has not come forth with any evidence that explains why the centerlines being off makes alignment relative to the valve body impossible. Similarly, NIBCO also at times appears to conflate “absolute alignment” with “perfectly aligned.” Simply because there may be problems with Tyco’s method – NIBCO specifically mentions tolerance stacking as being one such problem – does not mean that the process does not use absolute alignment. For all of these reasons, Tyco’s method does not infringe Claims 1, 4, 6, and 11.

2. Valve Disc Replica

Tyco also does not infringe Claims 1, 4, 6, and 11 because its method does not use a valve disc replica. The second step of these claims all require the use of a valve disc replica, which the Court construed to mean “a close copy” of a valve disc.

Plainly, there is no literal infringement by Tyco in relation to the valve disc replica. The physical characteristics of Tyco’s mold core are substantially different than the valve disc. The valve disc has a continuous bore through its center, while the mold core does not. (Kemp Rpt. at ¶45). Further, the mold core is up to three times thicker than Tyco’s 221/222 valve disc, and at the periphery, the mold cores is up to ten times thicker than the 221/222 valve disc. (*Id.*) Finally, a simple comparison of the valve disc and the lower mold core reveals that they are little alike in size or shape. (See Diagram at p. 41 of Tyco’s Memorandum in Support of Motion for SJ). In addition, Claims 1 and 6 specifically require “placing” the valve disc replica into the valve passageway and then, “removing” it once the elastomeric compound cures. Tyco’s process does not have these steps of “placing” and “removing” the valve disc replica.

The lower mold core is also not a valve disc replica under the doctrine of equivalents, as it does not perform substantially the same functions in substantially the same way as a valve disc replica. The valve disc replica performs several functions. One such function is providing a passage through which the valve stem replica passes. ('347 patent, col. 4, lns. 43-45). Because Tyco's alignment rods do not pass through the lower mold core, its lower mold core does not perform this function or anything substantially like it. As such, the doctrine of equivalents does not save NIBCO's claims regarding the valve disc replica.

3. Blind Socket

Claims 1, 4, 6, and 11 all require the use of a blind socket at some point. Claim 1 (and dependent Claims 4 and 11) reads:

[Preamble] The method of making a butterfly valve having a cast annular body defining a central axial fluid passageway and a tubular neck portion and a diametrically positioned blind socket for receiving an end of the valve stem of the assembled valve, the steps which include:

[Step 4] inserting a valve stem replica through the stem openings in the valve disc replica and both bushings and into the socket.

Claim 6 reads:

[Preamble] The method of making a butterfly valve having an annular metallic body defining a central axial fluid passageway and an intersecting tubular neck opening and a diametrically positioned blind socket for receiving the valve stem of the assembled valve, the steps which include:

[Step 1] placing bushings loosely in the neck and socket openings.

In our claim construction opinion, we found that "blind socket" is a limitation of NIBCO's claim and that "socket," refers to a "blind socket." We also construed "blind socket" to mean "a hole that does not pass completely through a workpiece and into which an inserted part is designed to fit," and that the socket "has to be blind at the time one calls it a 'blind

socket.’’

Thus, Claim 1 (and Claims 4 and 11) requires that there be a hole that does not pass completely through the workpiece and into which an inserted part is designed to fit at the time the valve stem replica is inserted through the stem openings. Clearly, this does not describe what happens in the Tyco process. In Tyco’s process, the holes pass completely through the neck portions of the valve. Each alignment rod is passed through one of the holes, and neither of these holes are “blind” at the time. (McClinton 12/9/04 Dep. at p. 223). Similarly, Claim 6 requires that there be a hole that does not pass completely through the workpiece and into which an inserted part is designed to fit at the time the bushings are placed in the socket opening. And just as is the case with Claims 1, 4 and 11, neither of the socket openings are blind at the time. (McClinton 12/9/04 Dep. at p. 224).

NIBCO argues that Tyco’s sockets are blind at two times during the molding process, but in both of these instances, the sockets do not become blind until after the bushing or valve stem replica is placed in the socket. The Court’s claim construction opinion made clear that the socket had to be blind at the time it is called a blind socket, and in this case, that means that it has to be blind when the bushing or valve stem replica is placed in the socket.

Finally, NIBCO’s only argument as to the doctrine of equivalents also relies on the socket becoming blind too late in the process, so that argument is unpersuasive for the same reasons. Claims 1, 4, 6 and 11 are not infringed by Tyco’s process because Tyco’s process does not utilize a blind socket at the relevant times.

B. Claim 7

Tyco claims that it does not infringe Claim 7 because it does not insert one or more thin,

straight bars through all the bushings to align them. This step is required for infringement under the '347 patent and the claim construction opinion. Clearly, Tyco does not literally insert one or more thin, straight bars through all the bushings to align them. This is so because, in Tyco's method, each alignment rod is passed through only one bushing.

NIBCO's better argument is that Tyco infringes under the doctrine of equivalents, but this also fails. As discussed in greater detail above, NIBCO disclaimed methods of alignment other than relative alignment, and the use of a single rod rather than multiple rods goes to the heart of relative alignment. And also as discussed above, Tyco's method does not utilize relative alignment. NIBCO argues that because the two alignment rods are connected by the donut in the middle of the mold, they are functionally the same as a single rod. As discussed several times, this is not true, because unlike with the use of a single rod, the position of one bushing does not affect the position of the other bushing.

In sum, the Tyco method does not infringe Claim 7 of the '347 patent because it does not insert one or more thin, straight bars through all the bushings to align them, and the method that Tyco does use is not equivalent to this either.

C. Claim 9

Similarly, Tyco does not infringe Claim 9 because they do not perform the second step of the Claim, which requires "inserting a close fitting common shaft through said bushings and causing them to align to the shaft." '347 patent, col. 9, lns. 39-41. Tyco's method does not use a "common" shaft. That is, it uses an alignment rod for each bushing, not a single common shaft through both bushings, so Tyco does not literally infringe Claim 9.

As for the doctrine of equivalents, once again, NIBCO argues that the difference between

using two alignment rods and using a single shaft extending through both bushings is insignificant. But as discussed before, the Court does not find this persuasive. In addition, under the doctrine of prosecution history estoppel, the applicants specifically disclaimed any process that uses absolute alignment. *See supra* at 8-10. The '347 patent describes a process that uses relative alignment, not absolute alignment. Tyco's process uses absolute alignment because there is no "common shaft" inserted into both bushings to keep the two bushings aligned relative to one another. By disclaiming in the prosecution history any process involving absolute alignment of the bushings, NIBCO cannot now claim that Tyco's process – which uses absolute alignment – is infringing under the doctrine of equivalents. *See DeMarini Sports*, 239 F.3d at 1332.

D. Claim 10

Claim 10 contains the step "providing an aligning means." The parties agreed that that step contained a means-plus-function claim limitation that had to be interpreted pursuant to 35 U.S.C. § 112, ¶ 6. The Court thus identified both the claimed function and the corresponding structure. *NOMOS Corp. v. BrainLAB USA, Inc.*, 357 F.3d 1364, 1367 (Fed. Cir. 2004). The Court looked to the patent specification to determine the corresponding structure that performed the claimed function of providing an aligning means, and determined that it was the valve stem replica. Thus, our claim construction opinion interpreted the words "aligning means" to mean "a close copy of the valve stem," the same interpretation we gave to "valve stem replica." As discussed in the section regarding the valve stem replica, Tyco does not use a "close copy of a valve stem." For the same reasons stated in that section, Tyco's process does not use an "aligning means" or an equivalent.

III. CONCLUSION

For the foregoing reasons, the Defendant's Motion for Summary Judgment [Doc. No. 106] is **GRANTED**. The Motion for Summary Judgment of Laches [Doc. No. 113] is **DENIED** as moot. The Motion for Leave to File Excess Pages [Doc. No. 107] is **GRANTED**. The Clerk is further directed to treat this matter as **TERMINATED**.

SO ORDERED.

ENTERED: September 30, 2005

s/ Philip P. Simon
PHILIP P. SIMON, JUDGE
UNITED STATES DISTRICT COURT